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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/808,721

03/24/2004

Wenzhe Luo

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5625

20350

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01/11/2005

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EXAMINER

JEAN PIERRE, PEGUY

ART UNIT

PAPER NUMBER

2819

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/808,721

Applicant(s)

LUO, WENZHE

Examiner

Peguy JeanPierre

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2819

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/24/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because it is described in the background of the invention. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in China on 3/15/2004. It is noted, however, that applicant has not filed a certified copy of the Chinese application as required by 35 U.S.C. 119(b).

3. Claims 7-11 and 16-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 7, lines 1-2, the term "the plurality of capacitor terminals is free from the first capacitor terminal and the third capacitor terminal" is confusing and unclear.

In claim 16, the term adjusting the each of the second plurality of capacitors terminals to one selected..." is confusing. It is not clear how the terminals can be adjusted, though

the voltages at each terminal could. It is not also clear how the fourth voltage could be adjusted by this process. Please clarify.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hodges (4,200,863) in view of Lee (USP 5,416,485).

Hodges et al. disclose in Figure 18, an apparatus for converting analog signal to a digital signal that comprises a plurality of capacitors (2^m) (see Figure). Each capacitor comprises a first terminal and a second terminal. The first terminals (one, three, five, seven...) are connected together and to an input terminal of an operational amplifier (34). The second terminals (two, four, six...) of the capacitor are connected to receive either a first voltage which is a ground voltage that is also connected to a second input of the operational amplifier, a reference or second voltage, an analog voltage (V_{in}) associated with an analog signal, a third voltage. The third voltage originates from a resistor string that comprises a plurality of resistors serially connected. One end of a first resistor is connected to ground and another end is connected to the reference or second voltage. The system comprises a successive approximation register (SAR) (see Figure) that generates a fourth voltage (V_x), that is adjusted in response to information associated with the analog voltage (see Fig. 3) and determines with the analog input

signal the digital bits (see output bit from SAR) (see Fig.2; col. 3, line 52 to col. 4, line 4. The fourth voltage is also associated with a first voltage level (see Fig. 18 switch S1), a second and a third voltage levels of the capacitors (see Fig. 18 switch S7), that are selected from a group consisting of the first voltage, the second voltage and the third voltage. It is to be noted from the Figure 17 that not 2^m-1 capacitors terminals are connected to the second voltage and the first voltage (see switches 42-48; capacitor "C" closer to the comparator (34) is not connected to the first voltage and the second voltage). It is also to be noted that the switches operate to couple and decouple the capacitors terminals namely (second, fourth, sixth...) to the first to fourth voltages; and they are controlled by the SAR that generate the fourth voltage. Based on the magnitude of the fourth voltage with regard to the analog voltage some of the switches will be closed if the digital bit is "1", i.e. coupled to the capacitors; and some if the digital bit is "0", i.e. decouple from the capacitors. Hodges fails to teach that the plurality of resistors have substantially equal value, the capacitance of the capacitors have the same capacitance; an operational amplifier.

Lee discloses in Figure 2 an analog to digital converter that comprises a resistor string (52) whose plurality of resistors have equal values (see col. 4, lines 2-4), a plurality of capacitors (65a-d) that are coupled to an input of an operational amplifier (66) whose capacitance values are the same (see col. 4, lines 21-31). The system of Lee will increase the resolution and the sampling rate of the analog to digital converter without excessive differential and integral non-linearity. Therefore, it would have been obvious to one having ordinary skill in the art to modify the converter of Hodges by substituting


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the equal value resistors and equal value capacitance as taught by Lee to improve performance and accuracy in SAR analog to digital converter.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fotouchi et al. (USP 5,258,761), Newcomb et al. (USP 4,668,936), Tsukakoshi et al. (USP 4,517,549), Yamakido (USP 4,369,433) disclose SAR analog to digital converters.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peguy JeanPierre whose telephone number is (571) 272-1803. The examiner fax phone number is (571) 273-1803.


Peguy JeanPierre
Primary Examiner